Royal Exclusiv pumps & skimmers

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Since 1986

★★★★★

v1.0

Operating- and maintenance manual Red Dragon® 4 pumps

For all Red Dragon® 4 Dreamliner and Superflow pumps 500, 800, 1100, 1600 Watt

ENG

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Please keep up this user's manual carefully!
On change of ownership you pass the complete user guide.

! Never use the device without water throughput !

1. Foreword

This manual is indented to inform you correctly and exhaustively, i.e. also over potential risks caused by the pump. The user, fitter and maintenance technician is responsible to check the compliance with the procedures and advises in this manual. The ***Red Dragon® 4*** are built with state-of-the art technology and to comply with existing safety regulations. Nevertheless this device may cause risks for individuals and for property, if it is used improperly or not regarding to its designated use, or if safety advises are ignored.
If the pump is used improperly, the liability of the manufacturer and the operating permit are void. For safety reasons children and juveniles younger than 16 years as well as people who do not recognize possible risks or who are not familiar with this manual may not use the device. Please preserve this manual carefully. In the case of a disposal please hand over the complete manual.

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On change of ownership pass
the complete user guide!

The combination of water and electricity can be a serious threat to life and limb, when not installed according to directions or when used improperly.

2. Use of the pump

Only use the device when no body parts have contact to the water! Before you reach into the water always disconnect the pump from the power supply. Compare the electrical specification on the type label of the device with the specification of the power supply. Make sure that the device is connected to an ELCB (earth leakage circuit breaker) with an assigned leakage rating of max. 30 mA (DIN VDE 0100T739). Only operate the device on a correctly installed power plug.

Keep the power plug and the wiring dry! Install the wiring protected in order to avoid damages.

IT IS NOT ALLOWD TO CUT THE WIRING OR THE POWER PLUG. DOING SO WILL IMMEDIATELY VOID ALL WARRANTY AND LIABILITY OF THE MANUFACTURER.

Only use wiring, installations, adapters, extension cables and connection cables with grounding-typ plugs, which are approved for outdoor usage (DIN VDE 0620) with sufficient cable diameter. Do not pull on the wiring of the device and to not use the wiring to carry the device! If the wiring is damaged or broken the device may no longer be used! Reparation is not possible as the wiring is permanently grouted in the engine housing. Take care that the power plug never falls into water or gets wet. If the plug gets wet in any kind, it has to be opened by a professional and cleaned by purging with demineralised water. Protect the plug and the wiring against heat, oil, UV light and sharp corners. The manufacturer is not liable in any way for any damages, which are made by improper installation or by the carelessness of the user or installer.

In general, when put out of service, the pump has to be cleaned extremely thoroughly. Before it newly brought into service the ease-of-movement of the impeller has to be checked by hand. If the impeller cannot be moved round by hand, the pump needs to be disassembled and cleaned completely. It is forbidden to disconnect the plug from the pump while the device is in use. This can result in serious damages to the electronic components and to dangerous situations due to grounding problems.

The wiring may not be modified or replaced. Electrical installations on garden ponds always have to be compliant and according to national and international directives and requirements. Never open the case of the device or of the appending parts if this is not explicitly suggested in the user manual. Never apply technical modifications the device. Only use original spare parts and accessories. Let only authorized customer service facilities conduct reparations. Never use the pump with other liquids than water. If you have any questions or problems consult an electrician, your dealer or the manufacturer ***Royal Exclusiv®***.

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3. Fields of application

The ***Red Dragon® 4*** pump is suitable for freshwater, brackwater and to pump other non-aggressive, non-explosive liquids that do not contain oil. It can haul clean as well as – to a certain extent – polluted water. The pump is not suitable for water with larger particles. The **pollutants** may **not exceed 0.8mm** in size.
In general the pump is to be used for applications with clean water. **Clean water** in this case is defined as water not containing solid particles, which could damage the bearings. Examples for particles or pollutants not suitable are sand, lime precipitation or pyrolosite after a manganese peroxide treatment in a pond. Damages caused by such pollutants in the water do not fall under warranty or service.

The most common use case for the ***Red Dragon® 4*** pumps are in the context of filtration systems (aquariums, ponds or swimming pools) and/or to supply a beck/creek or waterfall. The pump is not self-supplying and therefore can be used above the water surface and only in combination with a backpressure valve on the inlet pipe. In this case the pump has to be filled with water befor it is set into operation.

Temperature of the liquid:	+2 to +40°C.
Environment temperature:	0 °C to max. +50 °C
Max. working pressure:	2 bar (20m head of water)

4. Installation/Fitting

Caution:
Before you install the pump you have to read the manual thoroughly. Damages, which are caused because the manual was not read thoroughly, do not fall under warranty.

When unpacking the pump, check whether all parts were delivered completely and undamaged. Detected damages have to be reported within 24 hours after the purchase of the pump at your retail location. When unpacking the pump, it is possible that the inside of the pump is wet. The pump is tested before it leaves the factory.
Prior to its packaging the pump is treated with a biodegradable disinfectant in order to neutralize possibly present bacteria. The pump therefore has to be purged with water thoroughly before usage.
Please check the pump for damages before you set it into operation. Should the pump have damages it may not be set into operation. Please inform your retailer immediately if the pump is set into operation even though it is damaged, any warranty and liability is void.

Pull the plug electrical socket and make sure that the pump cannot be switch on. During the course of the installation the pump may not be connected to the power supply. To avoid injuries take care to reach not into the opening of the pump with your hands or fingers, when the pump is connected to the power supply.

5. Putting into operation of the pump

Never use the device **without water throughput**. The pump will automatically start when the power connection is established.

The pump may be used in almost any position. However it has to stand stable on a solid base. The inlet pipe is connected to the suction side of the pump *(see figure* **1***)*.

It has to be assured that the pump can be de-aerated through the outlet (**2**). The pump should ideally be placed beneath the water level.
The pump can be only placed out of the water *(dry)*. In the case of a dry placement, adequate air ventilation has to be assured. Furthermore the pump may not be exposed to direct sunlight. Place the pump as close as possible to the actual water connection; hence the inlet piping has to be as short as possible.

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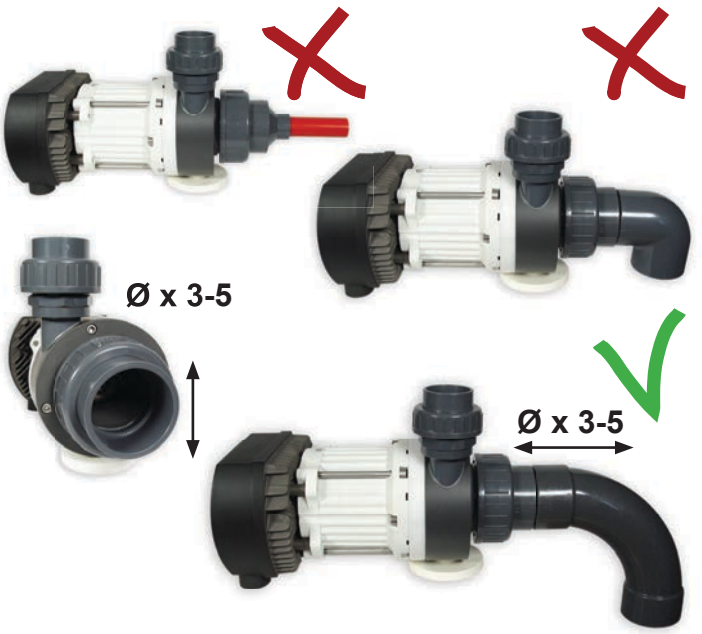
If the pump is placed above the water level (**6**) the installation of a backpressure valve (**7**) is mandatory. In this case the inlet piping of the pump has to be filled with water before the pump is set to operation. In such a setup the risk of the pump to run dry is very high, when the backpressure valve does not work properly. Damages which are caused by the pump running dry are excluded from warranty.

5.1. Inlet Pipe *(intake side)*
If no sufficient amount of water reaches the pump because the drag of the inlet pipe is to strong, the pump will consume a lot of power and the electronics gets very warm in the long run. The electronic contains a self-protection mechanism for this case and turn off. If the pump delivers less and less water after hours or days of operation it is possible that the inlet piping is too large.

The best thing is to enlarge the diameter of the piping on the inlet side by 1 – 2 sizes directly in front of the pump, in order to maximize the delivery rate and to minimize energy consumption.

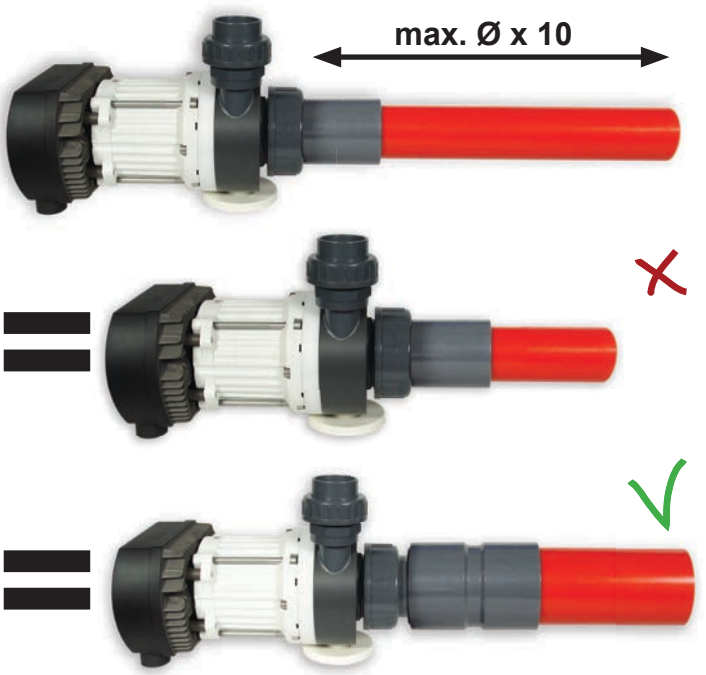
Any coupling has to be 100% air-proof. If a tube is used as inlet, this has to fulfil the requirements of a suction pipe.

It is **very important**, that the initial inlet at the pump is straight. (Minimum distance of 3-5x the diameter of the inlet pipe from the housing to the first bow). In this way the efficiency factor is maximized, because the water enters laminary at the impeller.



Always use bows instead of elbows.

If the inlet piping is longer than **max. Ø x 10** the inlet piping has to be 1 or 2 sizes larges than the intake of the pump.



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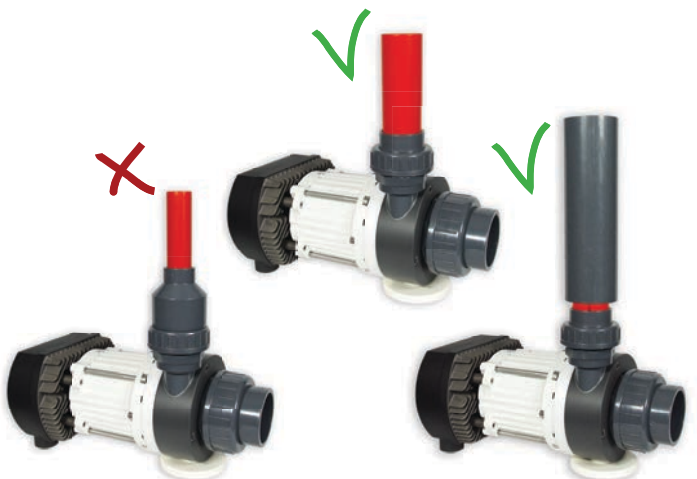
5.2. Pressure Pipe *(Pump outlet/pressure side)*
The pressure pipe should has to have the same diameter as the intake of the pump in order to minimize pressure loss, high flow rates and noise. The best thing is if you enlarge the pressure pipe directly after the pump oulet, in order to maximize the pump capacity and to safe energy.

Reducing of the diameter of the pump outlet is at the ***Red Dragon® 4*** pump to avoid.



If there is a danger that the pressure pipe gets completely blocked (e.g. by a ball valve) a bypass has to be installed in the pressure pipe, so that **always** a minimal flow of water trough the pump is guaranteed.

5.3. Electrical connection – setting-up operation
Check whether voltage and frequency on the type label of the pump match the supply voltage. The person, that´s responsible for the installation, has to check whether a standard conform grounding is available.

It is necessary to check if the electrical installation has a highly sensitive earth leakage circuit breaker (ELCB/GFCI) is available (30mA – DIN VDE 0100T739).

The fuse for the electrical net has to be one level higher than the fuse of the pump.

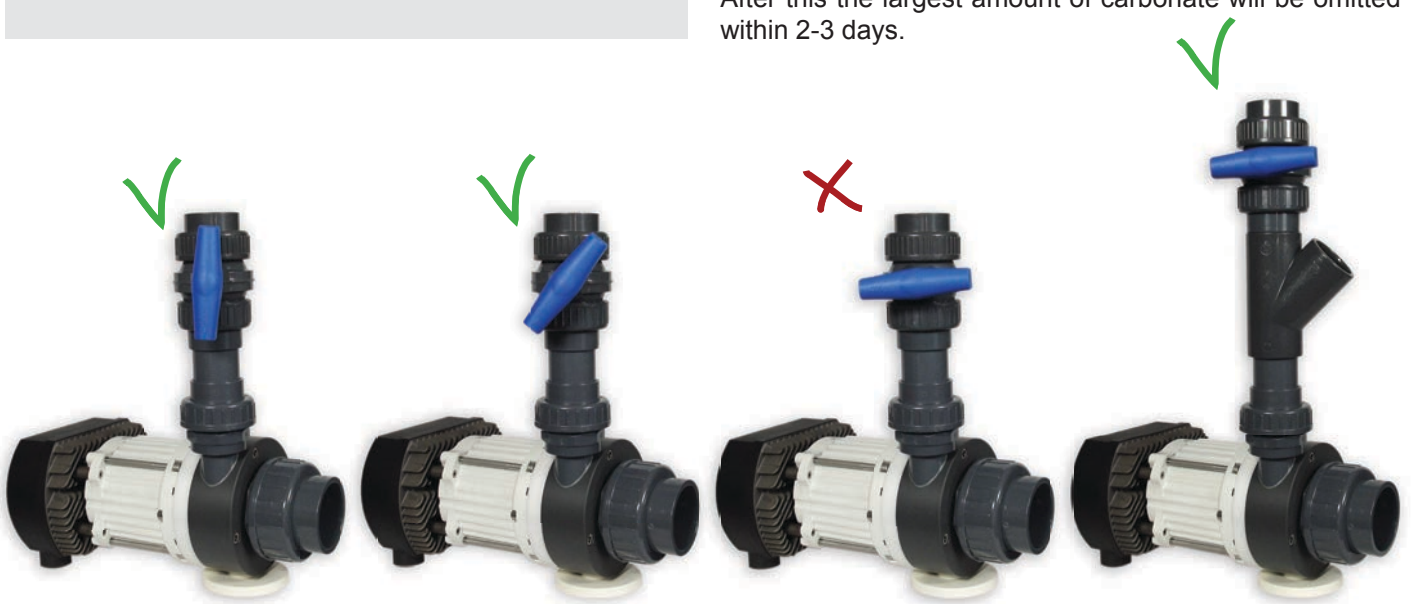
6. Maintenance and cleaning

Disconnect the pump from the power supply prior to each maintenance work.

Red Dragon® 4 supply- and flow pumps are essentially to be classified as low-maintenance. Usually the necessary maintenance work is limited to a check of the impeller for obstruction.

Remove obstacles from the impeller with a slim and spiky tool. A decreasing supply rate is often the result of dirt. Possible calcinations (especially in saltwater applications) has to be removed with a very soft acid as for instance vinegar. Avoid applying pressure to the sides of the impeller or the rotor. The pump can be disassembled nearly completely for cleaning.

In freshwater applications calcification only appears in very hard water and after a complete re-filling of the pond. After this the largest amount of carbonate will be omitted within 2-3 days.



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6.1. Disassembling of the pump

All ***Red Dragon® 4*** pumps feature an integrated automatic switch-off function. The energy input is continuously measured electronically. If power consumption increases for whatever reasons, e.g. in case of calcification resulting in sluggish bearings – the electronic system of the pump recognizes this as a failure and the pump is switched off automatically.

By plugging/unplugging the power plug the pump can be made ready for operation again. Please note that it is prohibited to circumvent the electronics to make the pump run again by constantly plugging/unplugging the power. If the ***Red Dragon® 4*** pump switches off, there is always a problem which must be remedied. This is usually a cleaning interval that is to be implemented. Continuous circumventing of the pump electronics may result in motor damage which is not covered by guarantee or goodwill. Furthermore, major impurities may generate vibrations.

We recommend to check the ***Red Dragon® 4*** pump already after three months, to determine the possible maintenance intervals that, can be depending on precipitation between 2-24 months.

Unplug or disconnect the power plug and remove the pump from the silicone hose with gently rotations. Or solve screw connection. Remove the four titanium pump head srews and check the impeller for snail shells, mussels, active carbon pellets, filter cotton or residual food. In case of larger accumulations, please clean the impeller. Pull out the impeller, clean and delime the entire pump.

Red Dragon® 4 Dreamliner and SuperFlow pumps generally require low maintenance. All in all, ***Red Dragon® 4*** pumps only need to be inspected for calcification and deposits in the stator space and the impeller at regular intervals and cleaned or decalcified if required.

Calcification is generally a problem when the ponds are topped up with tap water at an initial water hardness of over 10 dh. When initially/refilling ponds with tap water with a high lime content, sudden lime precipitation may occur within 2-3 days. Precipitated lime may block bearings and the electrical control will automatically switch off the pump to prevent overheating.

The following maintenance instructions describe the disassembly of a ***Red Dragon® 4*** pump step by step. Please observe the maintenance instructions precisely. Pump damage caused by blockages or forceful disassembly is not covered by warranty services.

Required tools:
Wrench M24
+ Allen wrench M8

Disconnect pump from the mains and let it cool off.

Use Allen wrench M8 to turn off the 4 housing screws and remove the head.

Use a large flat screw driver to carefully lift off the flange ring and remove it.

Grasp the impeller unit and pull it out.
In case of extreme blocks, pour the decalcifier into the solenoid armature space through 6 mm holes and leave approx. 20 minutes. Then carefully lift off the containment shell using a large screw driver.

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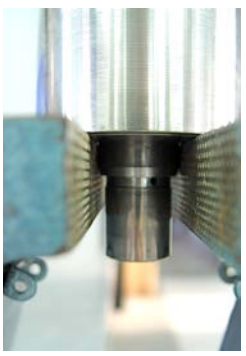
Caution: The stator is located just behind the flange. Please note that the coil must not be touched or damaged. Remove the containment shell.
Important: The O-ring may get caught on the containment shell. Be careful during reinstallation!



When unscrewing the impeller, clamp the unit in a vice.
Caution: Never clamp the axis to the slide bearing!!
Clamp only at the upper shaft area as shown in the picture. Use an M24 wrench to loosen the cap nut clockwise (left-hand thread) and disassemble the impeller and bearing plate.

Decalcify all individual parts after disassembly of all component parts.

! Do not use any hydrochloric acid! Not even if diluted !

Assembly: Fasten the O-ring in the groove in the stator space. Insert containment shell and impeller to the stop. Install and grease the O-ring.
The flange ring has two threads. Fasten the screw to the flange, insert the ring and slightly screw it into the blind hole. Carefully push down the flange and tighten the screws carefully cross-wise until the groove or flange and aluminium housing is closed. ***Caution:***
!! The thread is plastic so do not overtighten the screws !!

Assembly of pump head: Always ensure that the solid pump head does not rest sideways on the suction ring of the impeller. Therefore, it is recommended to fasten the pump head in the inlet duct from the top and then tighten the 4 M10 housing screws slightly cross-wise.
Free movement of the impeller must be continuously checked manually when cross-wise tightening the housing screws. (Turn).
If the impeller is installed tilted, it will be deformed which may result in imbalance, causing severe damage to the bearings. Bent impellers must be replaced. First tighten the housing screws lightly and then gradually tighten them more firmly.

Caution:
!! Do not overtighten the screws !! (Plastic thread)

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Check the impeller for freedom of movement. Unscrew the pump base and the V4A grub screw from the pump head.

Change/turn pump base + outflow direction:
The pump head can be turned in different directions according to the circumstances.
Turn off the grub screw and move the base.

6.2. Decalcification and cleaning of the impeller
Please decalcify the impeller unit using appropriated calcification baths.
Never use hydrochloric acid, **not even if diluted!!!** This may damage the pump. Suitable media are: formic acetic phosphoric acid or common decalcifying agents for water purification appliances such as coffee makers.
The containment shell of the motor must also be decalcified. Coarse, greasy plaques must be removed under ordinary tap water prior to decalcifying using a medium-coarse brush.

Please observe the relevant safety regulations attached to every sales package prior to using decalcifying acids. Wear protective clothing and goggles.

We hope you enjoy your
Red Dragon® 4 pump. Regular maintenance guarantees a long running time and service life.

Royal Exclusiv® in august 2012

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7. Defects and claims for compensation, disclaimer

7. Defects and claims for compensation

7.1. Barring any further claims we are only liable that the supplied goods are free of defects until the initial transfer of perils. Insignificant variations of the contracted appearance and workmanship or marginal limitation of the usability or suitability of the product are unremarkable.
The warranted condition, endurance and usability the product is solely subject to the specification agreed in writing, in the product specification and / or in this manual. Further oral agreements, especially from preliminary talks, advertising and / or in related industrial standards will are only valid as integral part of a written contract. Only conditions and specifications assured specifically by us are valid. We do not accept conditions or specifications made by third parties. Specifically the specification assured in this manual are valid. If the customer wants to use the product for other than the intended purpose, he is obliged to thoroughly the suitability of the product for the other purposes. We give no warranty and no liability accrues for any applications that are not agreed on by us explicitly and in written form.
Any manipulation of the pump, the (needle whell) impeller or the electronic as well as any attempt to modify the software, to influence the software or to read out or re-engineer the software of the driver unit immediately causes a loss of warranty and all claims and rights expire.

Every user is held responsible for the appropriate usage of his ***Red Dragon® 4*** pump. The user manual does not discharge you from your liability for a safe, appropriate and secure application, installation, operation and maintenance. By using this manual you agree that in no circumstances the manufacturer can or will be held liable for any personal injuries or property damages which possibly occur due to the usage of the device. This applies specifically for any damages that are due to inappropriate piping or plumbing.
Insufficient or missing cleaning- or maintenance intervals and damages that might result due to these are not covered by warranty. This applies especially for calcinations (salt water usage) and accumulated foreign particles (pond usage) such as sand or gravel, which lead to damages on rotors, bearings, rotor housing or motor housing, that are not covered by warranty.

7.2. Our warranty for defects is strictly limited to supplementary performance. This is upon our choice either removal of defects or replacement delivery free from defects. In the case of challenge, impossibility or failure of the supplementary performance the customer has the right for impairment or the right to withdraw from the contract.
Additional expenses which arise because the customer has brought the sales item to another place than his subsidiary. The manufacturer explicitly limits the warranty to the pump itself. We are not reliable for consequential damages, or damages that are caused by a malfunction or failure of the pump, such as a loss of animals. It is in the responsibility of the customer to provide back-up devices for the case of a potential malfunction or failure of the pump.

7.3. The customer has to check the goods immediately thoroughly, also for product safety. Apparent damages have to be reported in written form immediately. Hidden damages have to be reported immediately after their discovery. The customer is liable to report transport damages within 24 hours to the carrier and/or the delivery service. Disregarding the rules for checking and reporting results in a loss of warranty.

7.4. Furthermore we are not liable for the consequences of inappropriate application, usage, maintenance and handling of the product by the customer or his subsidiaries, neither for normal abrasion. This applies specifically to the consequences of thermal, chemical, electrochemical or electrical influences as well as for infringements against our uses- and maintenance manuals. The same applies to damages which are the result of changes or adjustments by the customer which have not been approved by us in beforehand.

7.5. Our liability for wanton negligence is limited to claims of injury of life, body and health, to claims based upon the law on product liability and to claims from culpable fundamental breach of the contract which peril contractual obligations. For the rest our liabilities for wantonly negligent breach of contractual obligations, which are foreseeable at the time of the conclusion of the contract, are barred.

Damages, which are unambiguously attributed to inappropriate usage of the product, are in general to be accounted for by the customer. In the case of returns of the product the customer has to use break-proof packaging for the product. The customer is liable for any damages that can be accounted to an inappropriate packaging.

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7.6. Claims against us become time-barred within a year after the initial delivery of the goods to the customer. The same applies to claims for damages regardless of their juridical cause. The limitation period does not apply to claims based upon the malicious concealment of damages from the injury of life, health or body and for other damages that result out of intention or wanton negligence.

7.7. If it becomes apparent during our examination of damages reported by the customer or in the course of our removal of defects, that the reported damages or claims were made wantonly negligent or unwarranted, we may charge an adequate consideration for our examination and for the removal of defects. The customer has the right to neglect a necessary repairing and to demand the return of the pump. In general every examination of damages is bound to lumpsum compensation if it occurs that the customer has to be accounted for the damages.

7.8. Spare parts
Our liability to deliver and hold spare parts available is limited to the period of 5 years after initial shipment of the product. Our respective list prices apply for spare parts.

7.9. Disposal
We offer our customers to take back products that fall under the restriction of hazardous substances directive (ElektroG) within Germany free of charge, for products, which were brought into circulation after the 13th of August 2005. We will take care for the disposal. If a customer chooses not to let us take care for the disposal, he takes the responsibility of a disposal according to legal regulations and discharges us from our liabilities according to §10 sect. 2 ElektroG and any associated liabilities of others.

7.10. Subject to alterations
The manufacture has the right for changes in hardware and software of the product at any time without preliminary notice, as long as these changes advance reliability or quality of the pump. No claims can be made if for instance design, functionality or performance of the pump changes elementary. The assured specification of the pump is always guaranteed.

8. Manufacturer's declaration

Titles against ***Royal Exclusiv®*** concerning the products described in this manual adress on the ***Royal Exclusiv®*** guarantee clauses.
Specification may vary due technical improvements.

8.1. Manufacturer

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Made in Germany

Royal-Exclusiv® EAR-number: WEE.Reg.No. 83082352

8.2. Informations and support
Thank your for purchasing a ***Royal Exclusiv® Red Dragon® 4*** pump. This pump is a high quality product made in Germany with the highest manufacturing demands on modern CNC maschines. This manual is supposed to help you to setup the pump for use and to advice you with the necessarily maintenance procedures.

To ensure longlasting satisfaction with this product we please you to read this manual carefully and follow our guidelines.

Royal Exclusiv® guarantees 5 years of spare part availability for the ***Red Dragon® 4*** pump.

Should the device in some way not meet the high demands you expect from ***Royal Exclusiv®*** please contact the dealer where you purchases your ***Red Dragon® 4*** pump. This is usually the best way for product support. However you may feel free to contact our support on our website: ***http://www.royal-exclusiv.de***